

*CONOPORA ADETA*, NEW SPECIES  
(HYDROZOA: STYLASTERIDAE) FROM AUSTRALIA,  
THE FIRST KNOWN UNATTACHED STYLASTERID

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*Abstract.*—A new species of *Conopora* is described from off Queensland, Australia, the first known unattached stylasterid. It always occurs in a symbiotic relationship with a polynoid polychaete, which determines the colony morphology. *Conopora adeta* is also the first deep-water stylasterid reported from off Australia (398 m) and the ninth record of a stylasterid from the Australian region.

Of the approximately 225 valid species of Stylasteridae (Cairns 1983b, 1986a,b), almost all are firmly attached, arborescent (uniplanar or bushy) colonies. The exceptions are the three species of *Stylantheca*, which are encrusting; and the two species of *Errinopsis*, which form fenestrate flabella that have multiple attachment sites to the substrate. The species described herein differs from all other stylasterids in that it is not attached to a substrate. Instead, the colony stands erect by forming a massive globose base that is stabilized by three to six dense, robust branches that radiate outward from it. Aside from the basal branches, branching is minimal, relegated primarily to very short, nonbifurcating branches originating from the U-shaped polychaete tube that serves as a substitute for the main stem of the colony.

Class Hydrozoa Owen, 1843  
Subclass Athecatae Hincks, 1868  
Order Filifera Kuhn, 1913  
Superfamily Hydractinioidea  
Bouillon, 1978  
Family Stylasteridae Gray, 1847  
*Conopora* Moseley, 1879

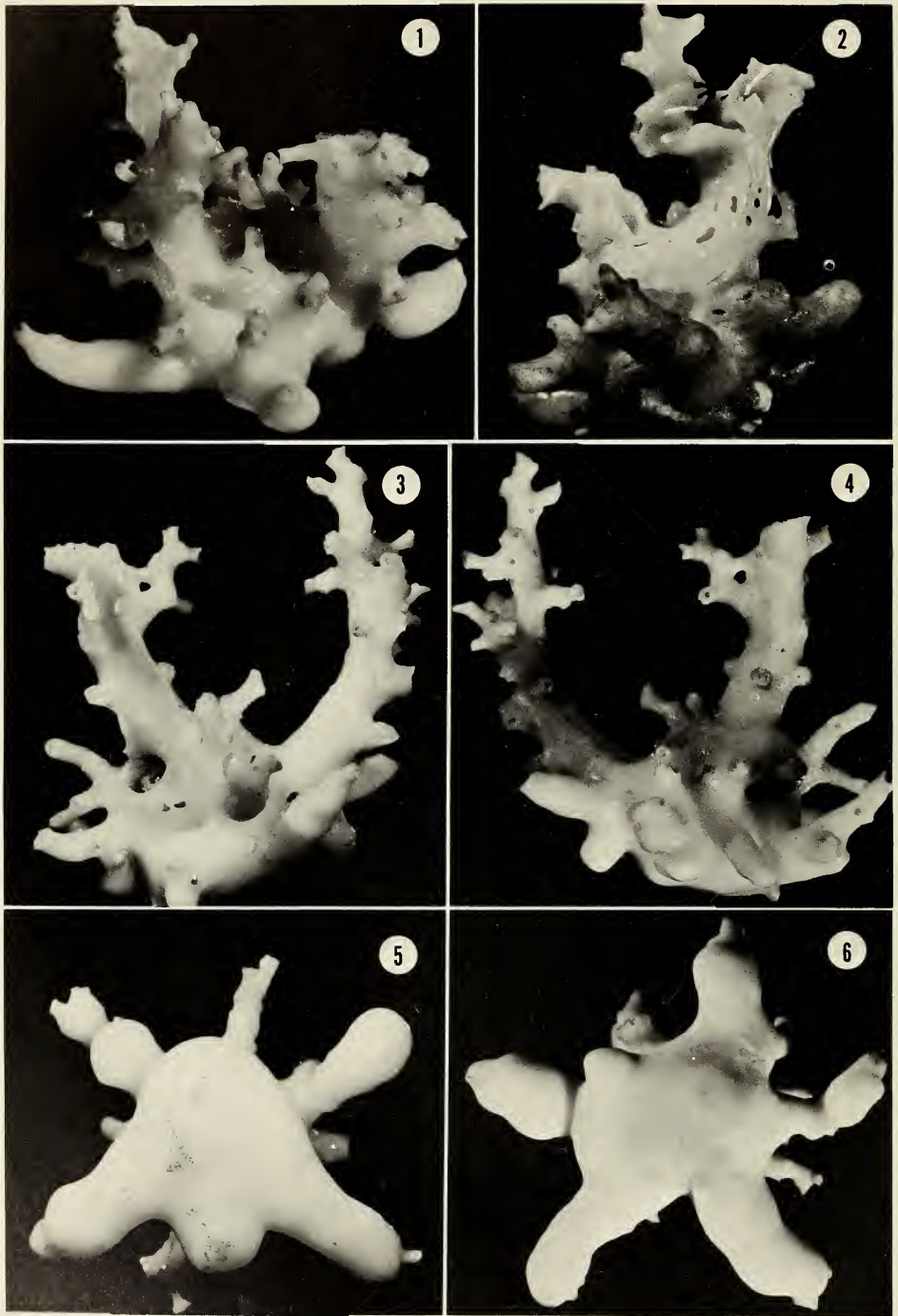
*Diagnosis.*—Colonies usually flabellate but sometimes bushy when modified by a commensal polychaete. Coenosteum linear-imbriate with broad, flat platelets (Group

A) or reticulate-granular (Group B); nematopores often present. Gastropore double-chambered, the larger upper chamber separated from the lower thinner one by a slightly constricted aperture. Gastro- and dactylostyles and gastrozoid tentacles absent. Female ampullae superficial; male ampullae both superficial and internal, often positioned near cyclo systems, with their efferent pores opening into a cyclo system or adjacent to one. Type species: *Conopora tenuis* Moseley, 1879 (= *C. laevis* (Studer, 1878)), by monotypy.

*Discussion.*—Cairns (1983b) divided *Conopora* into two groups: Group A, having delicate branches with sympodially arranged cyclo systems and linear-imbriate coenosteum, including three Recent species; and Group B, having robust branches with randomly arranged cyclo systems and reticulate-granular coenosteum, including one Recent and one fossil species. *Conopora adeta* belongs to Group A.

*Conopora adeta*, new species  
Figs. 1-15

*Description.*—Each colony consists of a globose mass 8-12 mm in diameter with a flat to slightly convex base from which 3-6 dense, robust branches project horizontal to substrate. Largest colony examined (the holotype) 32.5 × 28.7 mm in diameter, in-



Figs. 1-6. *Conopora adeta* (1, Holotype; 2-6, paratypes, all from F.R.V. *Soela* 25): 1, Holotype colony, oblique side view showing ascending polychaete tubes and basal stabilizing branches,  $\times 2.2$ ; 2, Side view of female colony showing porosity of worm tube,  $\times 2.2$ ; 3, 4, Opposing side views of a colony with tall ascending polychaete tubes, left tube of fig. 3 completely open,  $\times 2.3$ ; 5, 6, Basal view of two colonies showing robust radiating branches,  $\times 2.2$ ,  $\times 2.3$ , respectively.



cluding branches, and 21.0 mm tall. Globular mass permeated by a commensal polychaete, which also forms a porous U-shaped tube above the mass with parallel vertical elements (see Remarks). Large basal branches up to 5 mm in diameter and 8–12 mm long, sometimes clavate. Shorter branches, up to 6 mm long and 1.5 mm in diameter and bearing only 3–5 cyclosystems, occur on upper part of globose mass, project from ascending polychaete tubes, and occasionally occur on upper part of basal branches. Each basal branch also usually bears one apical cyclosystem. Smooth base of colony also lacks cyclosystems.

Cyclosystems sympodially arranged, round (0.75–0.90 mm in diameter), and usually flush with coenosteum. Based on 32 cyclosystems, there is a range of 12–17 dactylopores per cyclosystem, mean = 14.19 ( $\sigma = 1.21$ ), and mode of 15. Diastemas not present.

Upper chamber of gastropore tube cylindrical to very slightly tapered, about 0.5 mm in height and diameter. Aperture to lower chamber not constricted. Lower chamber slightly greater in diameter than upper and about 0.35 mm deep. Low, longitudinal carinae about 25  $\mu\text{m}$  wide present in lower chamber (Fig. 10). Dactylotomes about 77  $\mu\text{m}$  wide; pseudosepta of equal width and slightly convex.

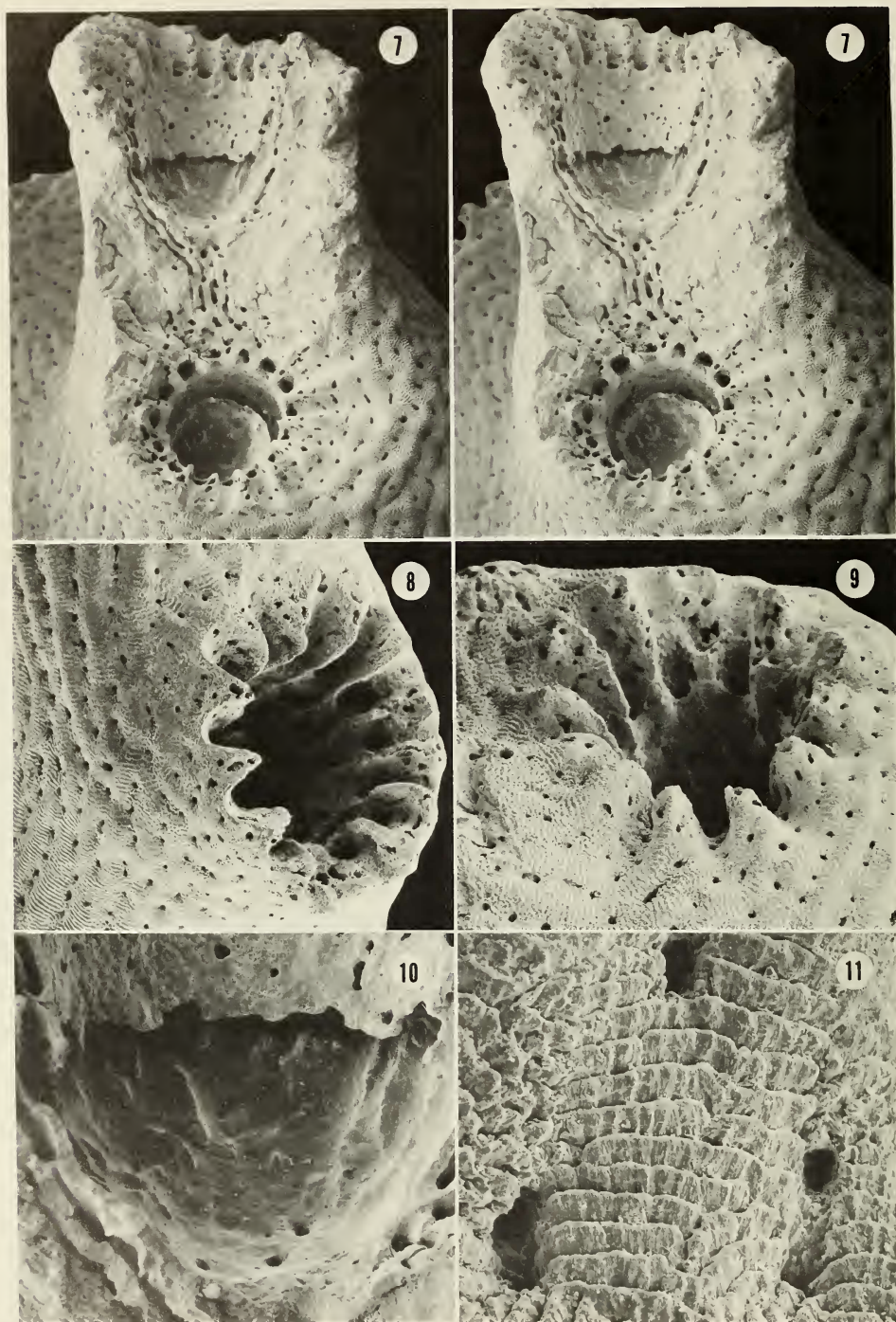
Female ampullae massive, elongate hemispheres about  $1.45 \times 1.25$  mm in diameter. Female efferent pores about 0.35 mm in diameter. Male ampullae also elongate and superficial but significantly smaller (e.g.,  $1.0 \times 0.71$  mm) and with less relief. Male efferent pores round, 50–60  $\mu\text{m}$  in diameter, and in a lateral position. Some cyclosystems surrounded by 4 or 5 male ampullae, all of which have their efferent pores adjacent to the cyclosystem (Fig. 15). Ampullae also scattered over worm tube coenosteum.

*Remarks.*—All ten specimens examined lived in association with a commensal polychaete, an undescribed genus and species of

polynoid (pers. comm., M. Pettibone 1986), which creates a tubular cavity in the stylasterid's globular mass, the cavity consisting of an upward spiral of two or three horizontal revolutions. The tube emerges from the mass apically and induces the coral to form the characteristic U-shaped highly porous tube alluded to in the description. The vertical elements of the tube are up to 14 mm tall and about 3.5 mm in diameter. In two specimens, one of the vertical elements was bifurcate. In several cases the cavity also emerged from the side or base of the spherical mass with a pore diameter of 1.2–1.5 mm.

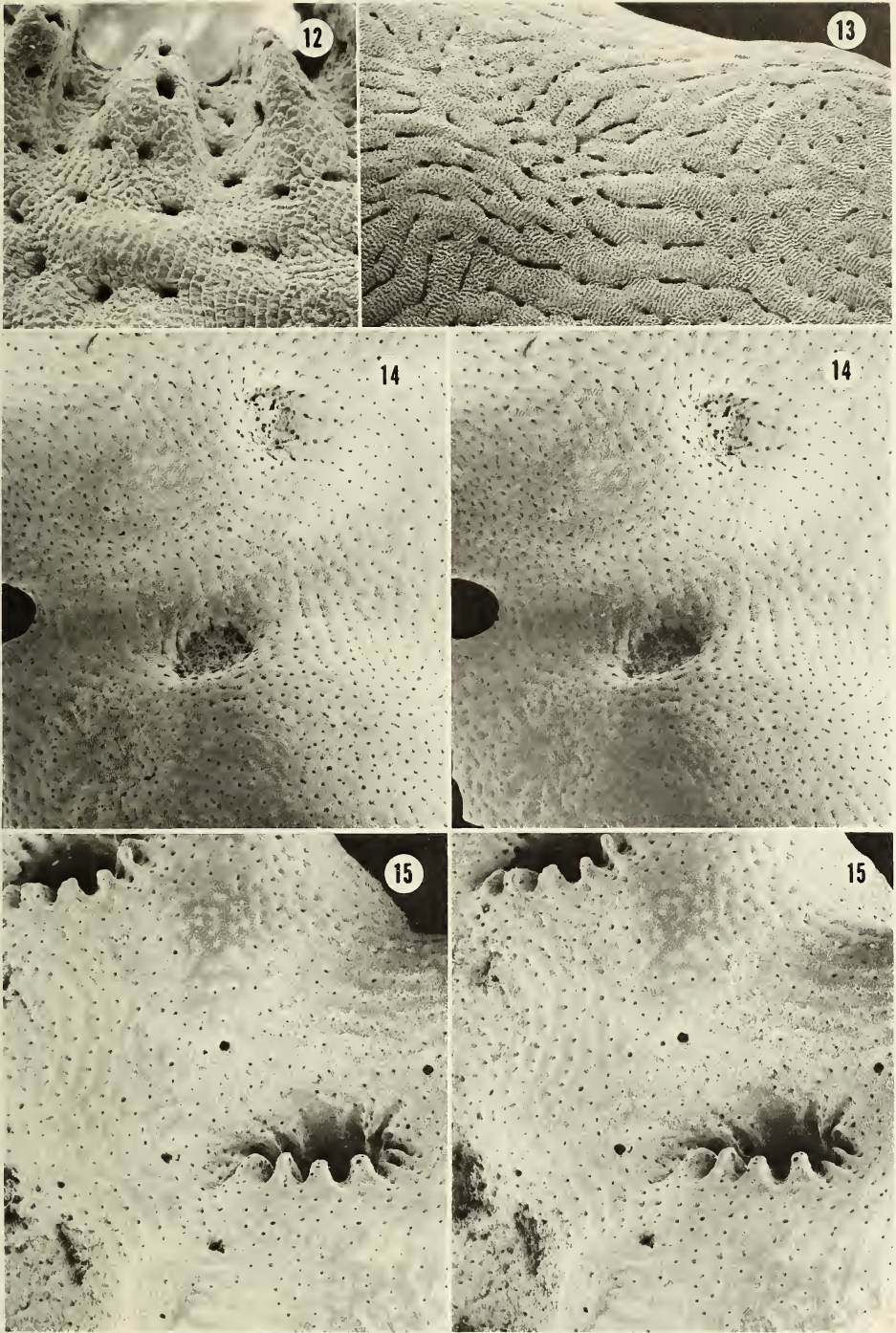
In two specimens a small aplacophoran mollusk inhabited the upper section of the polychaete tube.

Of the ten specimens available for study, all had smooth bases without evidence of former attachment. Nonetheless, it is hypothesized that each colony was originally attached to a substrate via planula settlement, as is the case for all stylasterids, but in *C. adeta* the substrate is assumed to have been small (e.g., a sand grain or a small mollusk shell) and that the coral quickly overgrew it. The symbiotic polychaete probably also became associated with the coral early in ontogeny. Because the hypothesized original substrate was small and not capable of supporting an arborescent colony, it is suggested that the colony stabilized itself by producing robust radiating branches from the basal globular mass. The adaptive value of an unattached colony is not clear. It is unlikely that the polychaete can move the colony to a different site or that the colony is ever transported any distance. This unusual adaptation may simply be the result of the lack of an adequately firm substrate and may even represent a form of a species that is normally attached when the proper substrate is available. Symbiosis with polynoid polychaetes that form similar globular cavities in attached stylasterid colonies is not rare (e.g., *Stenohelia concinna* Boschma, 1964, *Stenohelia ro-*



Figs. 7-11. *Conopora adeta*, paratypes from F.R.V. *Soela* 25: 7, Longitudinal section and top view of two cyclosystems, stereo pair,  $\times 32$ ; 8, 9, Cyclosystems,  $\times 49$ ,  $\times 63$ , respectively; 10, Longitudinal section of lower gastropore chamber of specimen in fig. 7,  $\times 109$ ; 11, Coenosteal platelets,  $\times 345$ .





Figs. 12–15. *Conopora adeta*, paratypes from F.R.V. Soela 25: 12, Several pseudosepta and adjacent coenosteal strip,  $\times 123$ ; 13, Two male ampullae and coenosteal strips,  $\times 44$ ; 14, Two female ampullae, each with a large efferent pore, stereo pair,  $\times 26$ ; 15, A cyclo system surrounded by four male ampullae, each with an efferent pore adjacent to the cyclo system, stereo pair,  $\times 27$ .

*busta* Boschma, 1964, *Errina macrogaster* Marenzeller, 1904) (see Cairns 1986b).

*Discussion.*—There are only four previously described Recent species of *Conopora* (Cairns 1983b). *Conopora adeta* clearly belongs to Group A (sensu Cairns 1983b) because of its sympodially arranged cyclo-systems and delicate branches with linear-imbriate coenosteum. This group includes three other species: *C. major* Hickson and England, 1905 (Banda and Celebes Seas, 204–1901 m); *C. verrucosa* (Studer, 1878) (Antarctic and Subantarctic, 216–2544 m; see *C. pauciseptata* of Cairns, 1983a); and *C. laevis* (Studer, 1878) (New Zealand, Kermadec Islands, 110–951 m; see Cairns 1983b:490). *Conopora adeta* is distinguished from all three species by its unattached growth mode, smaller cyclo-systems, and higher number of dactylopores per cyclo-system. All four species have commensal polychaetes, broad imbricate platelets, and similarly shaped gastropore chambers.

Eight species of stylasterids have been previously reported from off Australia (Boschma 1957): *Distichopora violacea* (Pallas, 1766); *D. nitida* Verrill, 1864; *D. concinna* Gray, 1860; *Stylaster granulosus* Milne Edwards and Haime, 1850; *S. sanguineus* Milne Edwards and Haime, 1850; *S. gracilis* Milne Edwards and Haime, 1850; *S. incompletus* (Tenison-Woods, 1883); and the Miocene *S. mooraboolensis* (Hall, 1893). *Conopora adeta* is the first species reported from relatively deep water off Australia.

*Etymology.*—The specific name is from the Greek *adetos*, meaning “free,” “loose,” and “unbound,” in reference to the unattached growth mode of this species.

*Types.*—Holotype: male, N.T.M. (North-

ern Territories Museum) C5385.—Paratypes: 4 specimens, USNM 76299; 5 specimens, N.T.M. C5386.

*Type locality.*—F.R.V. *Soela* 25: 20°46.2'S, 152°51.8'E (Marion Plateau, off MacKay, Queensland, Australia), 398–399 m, 22 Nov 1985.

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